CHAPTER 3 – INVENTORY

3.1 Introduction

The Washington State Department of Transportation Washington Aviation System Plan Update (WASP) includes a study of the existing capacity, aviation trends, system performance, and market demand and needs of the Washington State public airport system. Information collected from a system-wide survey as well as the WSDOT Airport Information System (AIS) database update effort provides a look at the existing conditions of the state's airport facilities and provides the basis from which to evaluate future demands in airline passenger traffic, air cargo and general aviation activity, system performance, and future system needs. The information collected in this study provided a set of criteria from which to base a new state classification system to improve system performance. The data collected in this process was used to update the WSDOT AIS database for all airports included in the inventory. This chapter provides an overview of the 2015 WASP survey and inventory effort.

3.1.1 Inventory Process

A total of 136 Washington State public-use airports are included in the 2015 WASP study. The inventory includes all public-use facilities; those included in the Federal Aviation Administration's (FAA) 2015-2019 National Plan of Integrated Airport Systems (NPIAS) and those that are not. The inventory data was collected primarily by means of a written survey that was provided to airport management via email and U.S. mail. Participants were also informed that the survey could be conducted over the phone if this was their preference. Surveys were distributed in October 2015 and responses were received through January 2016. The survey included requests for information in the following categories:

- General airport information
- Operation activity
- Historical activity
- Fueling infrastructure and services
- Economic development and vitality
- Education and outreach/community engagement
- Infrastructure improvement, preservation, and capacity
- Innovation

Airport managers, WSDOT aviation division staff, and study consultants participated in providing data for the survey. Follow-up phone calls were made by study consultants to maximize the survey responses, and many incomplete surveys were completed by phone or additional email correspondence with airport management or administrative staff. In addition, information was verified and supplemented through the following secondary sources:

- FAA Form 5010, Airport Master Record
- FAA Air Traffic Activity System
- AirNav.com
- WSDOT Airport Information System database

- WSDOT Aviation Division 2012 Aviation Economic Impact Study
- WSDOT Aviation Division 2013 Washington State Airport Pavement Management System Report
- WSDOT Aviation Division 2016 Statewide Airports Profile Report
- Airport master plans (as available)
- Airport layout plans (as available)

A total of 112 surveys of the 136 WASP study facilities were completed and submitted—an 82-percent response rate. The inventory data are presented in the following narrative, supplemented by tables and figures. An inventory summary is provided at the end of this chapter to highlight key findings and to summarize the data collected.

3.1.2 Existing Airport System

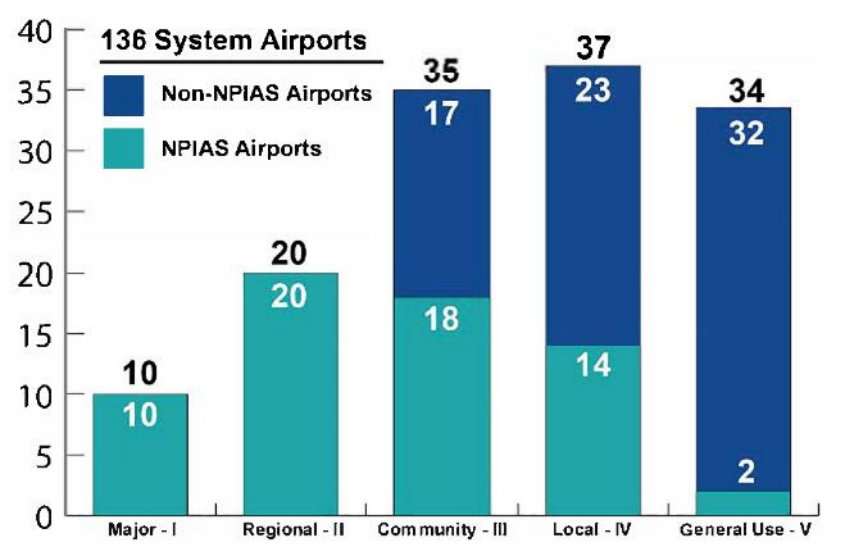
There are 544 aviation facilities, including 360 airports 165 heliports, 16 seaplane bases and 3 ultralight fields in Washington State, of which 136 airports are listed as public-use facilities (Figure 3-1) and the other 240 airports are listed as private-use.[1] Airport classifications have been updated during the preparation of this study to more closely tie each airport facility to the size of the community it serves. The new Washington State Classification naming conventions include "Major," "Regional," "Community," "Local," and "General Use" airports. The new classifications will be used throughout this chapter to describe the existing aviation system. A complete description of the classification methodology and criterion is presented in Chapter 6.

In Washington State, a total of 10 airports are classified as *Major* airports, providing commercial service and serving communities of 2.2 million to 55,000 residents. *Regional* airports do not provide commercial service, however, they do serve communities of 34,000 to 2.1 million residents with corporate and business travel or commuter passenger service. There are 20 airports in the state that fit this classification. The remaining 106 airports are categorized as *Community*, *Local*, or *General Use* airports.

These airports have a variety of owners and operators, with over 100 public-use airports operating under public ownership and management, including city/municipality, port district, and state, county, or joint government ownership. According to the AIS state profile report, 29 are privately owned. There are a total of 16 state-managed airports, 9 of which are state-owned with the others operated by special-use permit, lease, or right-of-entry.[2]

[1] FAA, Airport Data as of 3/31/2016, NFDC Facilities Report, http://www.faa.gov/airports/airport_safety/airportdata_5010/menu/#datadownloads
[2] WSDOT, Airport Information System Database, 2016

Figure 3-1. Distribution of System Airports Amount Classifications



3.1.3 National Plan of Integrated Airport System

The National Plan of Integrated Airport System (NPIAS) are those facilities that are deemed by FAA to be significant to the national air transportation system. The NPIAS is maintained by FAA and published and reported to Congress every two years. The NPIAS includes a plan for the type and cost of eligible airport development that the Secretary of Transportation, "…considers necessary to provide a safe, efficient, and integrated system of public-use airports adequate to anticipate and meet the needs of civil aeronautics, to meet the national defense requirements of the Secretary of Defense, and to meet the identified needs of the United States Postal Service."[3] Airports included in the NPIAS are eligible to receive federal airport improvement plan (AIP) funding. A total of 64 airports in the Washington state system are NPIAS facilities. Three of these are privately owned facilities (Harvey Field, Kenmore Air Harbor Lake Washington and Whidbey Airpark) and the remaining 61 are publicly owned (Figure 3-2).

Primary Airports

According to the Report to Congress, NPIAS 2015–2019, primary airports are those public-use airports that receive scheduled air service with 10,000 or more enplaned passengers per year.[4] These airports are grouped into four categories: large, medium, small, and non-hub. There are 10 primary airports in the Washington State system as listed in Table 3-1 (Figure 3-3).

[3] FAA, NPIAS Report to Congress (2015–2019)
[4] FAA, NPIAS Report to Congress (2015–2019), Appendix A

Figure 3-2. Washington State Public Use Airports

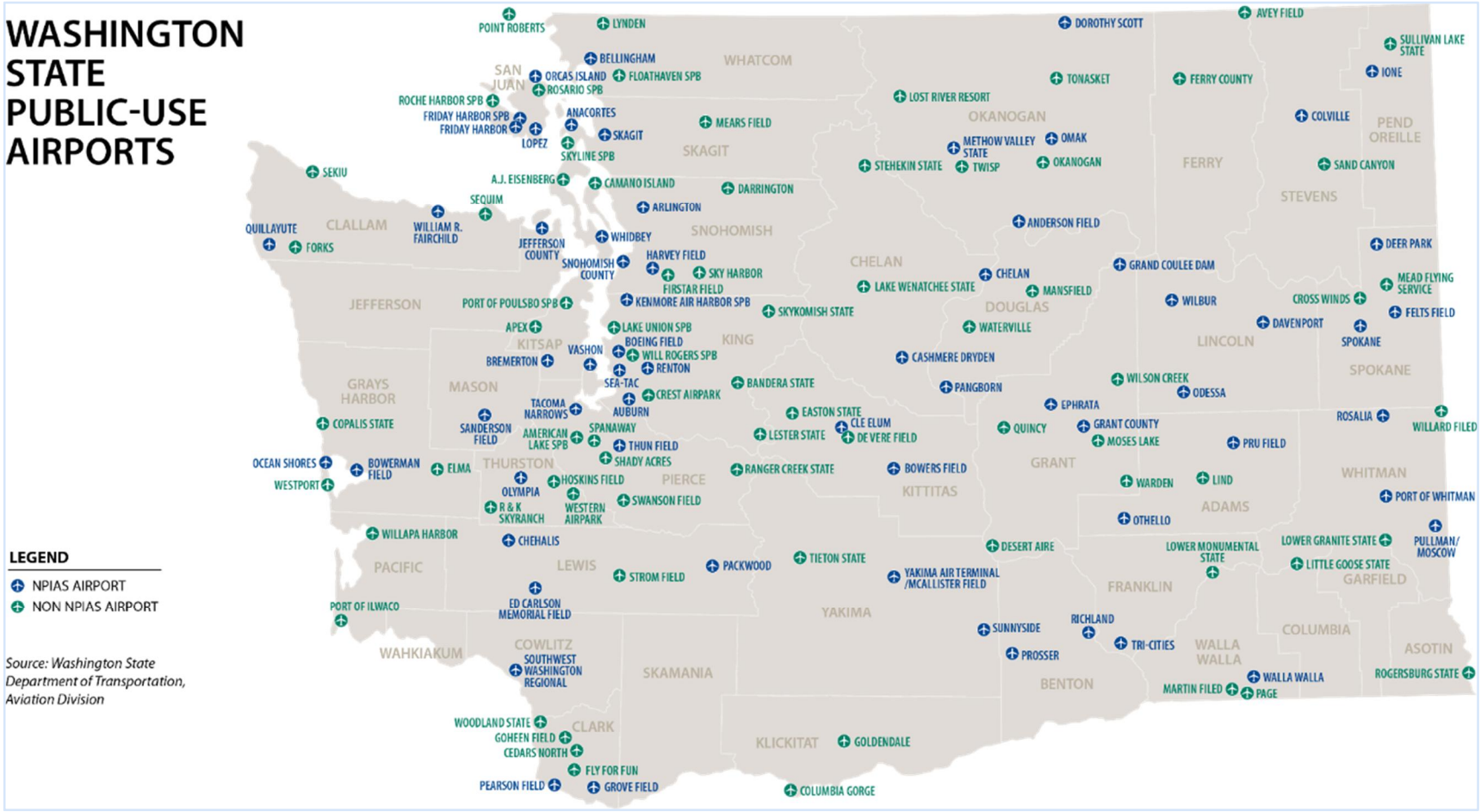


Figure 3-3. NPIAS Primary and Non-primary Airports

Table 3-1. NPIAS Primary Airports

CITY	AIRPORT
Bellingham	Bellingham International
Friday Harbor	Friday Harbor
Pasco	Tri-Cities
Pullman	Pullman/Moscow Regional
Seattle	Boeing Field/King County International
Seattle	Seattle-Tacoma International
Spokane	Spokane International
Walla Walla	Walla Walla Regional
Wenatchee	Pangborn Memorial
Yakima	Yakima Air Terminal/McAllister Field

Source: FAA, NPIAS Report to Congress (2015–2019), Appendix A.

Non-primary Airports

Non-primary airports are facilities that are used by general aviation aircraft and include non-primary commercial service airports (public facilities that receive scheduled passenger service between 2,500 and 9,999 enplaned passengers per year), general aviation airports, and reliever airports.[5] Reliever airports are defined as those airports designated by FAA as having the function of relieving congestion at a commercial service airport and providing more general aviation access to the overall community. Non-primary airports are grouped into five FAA categories: national, regional, local, basic, and unclassified. Of the 54 non-primary airports in Washington, 5 airports have the "reliever" designation, as shown in Table 3-2.

Table 3-2. General Aviation Reliever Airports

CITY	AIRPORT	CATEGORY
Auburn	Auburn Municipal	Regional
Everett	Snohomish County (Paine Field)	National
Renton	Renton Municipal	Regional
Snohomish	Harvey Field	Local
Spokane	Felts Field	Regional

Source: FAA, NPIAS Report to Congress (2015–2019), Appendix A.

[5] FAA, NPIAS Report to Congress (2015–2019), Appendix A

3.1.4 FAA Asset

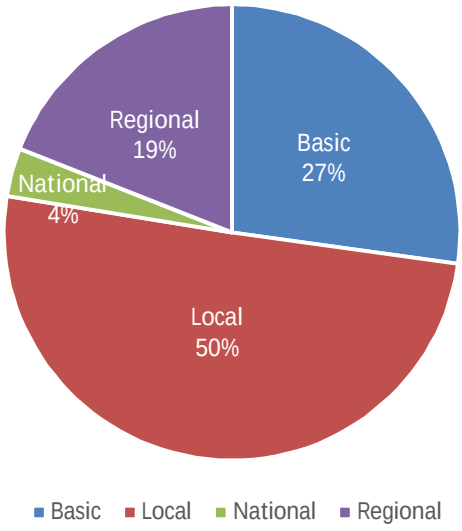
FAA conducted an 18-month study to further classify the general aviation airports included in the NPIAS, the results of which were published in the report titled *General Aviation Airports: A National Asset* (ASSET) in May 2012. This report documented the importance of the general aviation airport system, the need for new general aviation categories, a description of each of the four ASSET categories, and a list of each airport in the NPIAS categorized by ASSET category (Figure 3-4).

ASSET noted five key aeronautical functions provided by the general aviation airport system which include[6]:

- Emergency preparedness and response
- Critical community access for remote areas
- Commercial, industrial, and economic activity functions
- Access to tourism and special events
- Other aviation specific functions, including corporate flights and flight instruction

The ASSET categories were developed to provide policy makers with a better understanding of the vast and diverse general aviation system. While more detailed than the previous category designation of either general aviation-reliever or general aviation, these federal categories are broad and do not replace existing statewide system planning or airport master planning roles or categories that utilize unique and more-detailed site-specific data to determine their role in the state or community. Figure 3-4 shows the percentage of Washington state airports in each FAA ASSET category.

Figure 3-4. Washington State Airports by FAA ASSET Category



[6] FAA, General Aviation Airports: A National Asset, May 2012

3.1.5 Non-NPIAS Airports

There are 72 airports included in the study that are non-NPIAS airports. Non-NPIAS airports represent over 50 percent of the state's system that does not meet FAA's minimum NPIAS entry criteria; however, these airports are included in the state's system plan as they have a state or regional significance. Because these airports are not eligible to receive federal AIP funding—funding and support typically comes from non-federal sources, such as local, state, or private funding. In other words, more than half of the Washington state airport system is reliant on funding sources outside AIP funding. Non-NPIAS airports are shown on Figure 3-2.

3.2 Airside Facility Inventory

This section includes a summary of the major airside facilities for study airports. This includes an inventory of runways and taxiways as well as a discussion of runway safety areas and protection zones.

3.2.1 Runways

Of the 136 study airports, there are a total of 368 runways inventoried in the AIS database. These include primary, parallel, crosswind, and other supplemental runway types (Table 3-3 and Table 3-4). A runway is a defined rectangular area prepared for the landing and takeoff of aircraft. Runways may be either a man-made surface or a natural surface. Having a complete inventory of the total number of runways in a system allows the State to calculate and understand the capacity of the state's aviation system. All of the *Major* airports have multiple runways.

Length

When discussing runway length, 5,000 feet represents a significant milestone for airport planning purposes, especially at airports with only one runway. Many insurance providers require that insured aircraft operators only operate on runways with a length of 5,000 feet; this includes many air ambulance operators as well as corporate jet operators. The impact of this runway length requirement can be felt at smaller, more rural communities where air ambulance aircraft cannot operate and at airports where increased corporate jet activity is taking place.

According to WSDOT's AIS database, primary runway lengths range from 1,471 feet to 11,900 feet. Approximately 27 percent of the systems runways are 5,000 feet or longer and 62 percent of the *Major* airport runways meet this criterion. Table 3-5 shows the number of runways and percentages of runways meeting the 5,000-foot criteria. Several *Major* classified airports have more than one runway and lengths can be both over and under the 5,000-foot length. The average primary runway length at *Major* airports is 8,966 feet (Table 3-6).

Top 5 airports by longest paved runway (Based on the WSDOT Aviation Division 2016 Statewide Airports Profile Report):

1. *Grant County International*
2. *Sea-Tac International*
3. *Spokane International*
4. *Boeing Field/King County International*
5. *Snohomish County/Paine Field*

Surface Type and Condition

The Washington State system airport primary runway surfaces include paved concrete, concrete/asphalt, paved asphalt, turf, turf/gravel, as well as water. Of all "paved" runways in the system, 6 percent are paved concrete, 3 percent are asphalt/concrete, and 66 percent are paved asphalt. Approximately 9 percent of all runways are water surfaces, 11 percent are turf or turf and gravel runways. Figure 3-5 shows all runway surfaces and Figure 3-6 shows primary runway surface types.

Table 3-3. Runway Types and Surfaces by Classification

AIRPORT CLASSIFICATION AND RUNWAY/SURFACE TYPE	NUMBER OF RUNWAYS
Major	26
Crosswind runway	3
Asphalt	1
Concrete	2
Supplemental runway	1
Asphalt	1
Primary runway	22
Asphalt	14
Asphalt/concrete	3
Concrete	5
Regional	35
Crosswind runway	5
Asphalt	5
Supplemental runway	4
Asphalt	3
Water	1
Primary runway	26
Asphalt	21
Concrete	3
Other	1
Turf	1
Community	44
Crosswind runway	1
Turf/gravel	1
Primary runway	43
Asphalt	40
Asphalt/concrete	2
Turf	1
Local	40
Primary runway	40
Asphalt	37
Concrete	1
Null	1
Other	1
General use	38
Supplemental runway	1
Water	1
Primary runway	37
Other	6
Turf	13
Turf/gravel	4
Water	14

Source: WSDOT, Airport Information System database, 2016

Table 3-4. Average Number of Runways per Airport by Classification

CLASSIFICATION	AVERAGE NUMBER OF RUNWAYS
Major	2.6
Regional	1.75
Community	1.25
Local	1.1
General Use	1.1

Source: WSDOT, Airport Information System (database, 2016)

Table 3-5. Number and Percent of System Runways that are 5,000 feet or Longer

CLASSIFICATION	RUNWAYS 5,000 FEET OR LONGER	PERCENT OF RUNWAYS 5,000 FEET OR LONGER
Major	32	62%
Regional	34	49%
Community	5	6%
Local	2	3%
General Use	24	32%
Overall System	97	27%

Source: WSDOT, Airport Information System database, 2016, as reported by Kimley-Horn, 2016

Table 3-6. Primary Runway Length Averages by WA State Classification

CLASSIFICATION	AVERAGE PRIMARY RUNWAY LENGTH
Major	8,966
Regional	4,974
Community	3,041
Local	3,092
General Use	3,405

Source: WSDOT, Airport Information System (AIS) database, 2016, as reported by Kimley-Horn, 2016

Figure 3-5. Runway Surfaces for all Runways System-wide

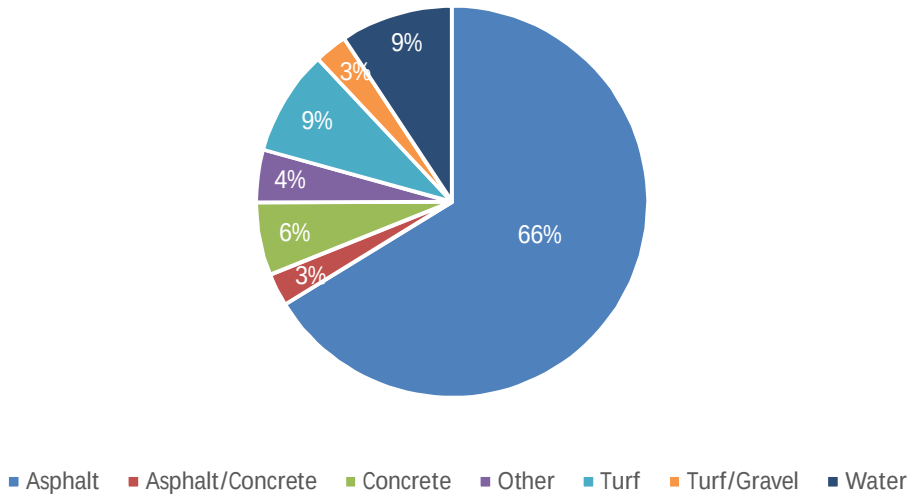
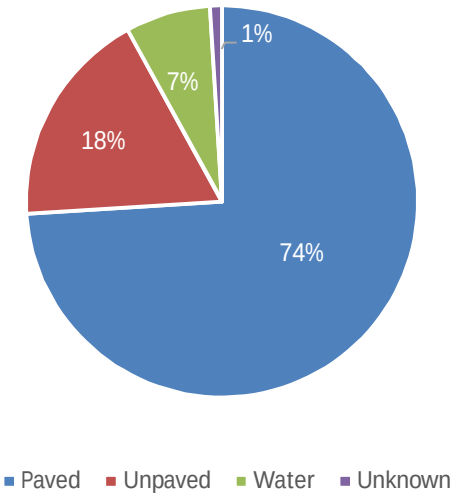


Figure 3-6. Primary Runway Surface Types



WSDOT Aviation conducts a system-wide study of airport pavement condition approximately every five years to identify pavement needs and to provide information for programming and decision making in the maintenance of facilities statewide. The condition of runway, taxiway, and apron pavement is an important performance measure of the system's safety and cost effectiveness. Pavement preservation and maintenance is noted to be "one of the largest capital investments in the aviation system."[7]

[7] WSDOT, Washington State Airport Pavement Management System, Executive Summary, 2013

According to the *2013 Washington State Airport Pavement Management System* report, primary NPIAS airports have shown improved condition in pavement since 2005, while non-primary NPIAS and non-NPIAS facilities show a significant decrease in condition.[8]

At the airports that were evaluated, approximately 71 percent of the pavement area was in need of preventative maintenance and 29 percent had deteriorated to a condition that would require either major rehabilitation or possibly reconstruction, which is far more costly than preventative maintenance.

3.2.2 Runway Safety Areas

Aircraft can and do occasionally overrun the ends of runways, sometimes with devastating results. An overrun occurs when an aircraft passes beyond the end of a runway during an aborted takeoff or while landing. Data on aircraft overruns over a 12-year period (1975 to 1987) indicate that approximately 90% of all overruns occur at exit speeds of 70 knots or less and most come to rest between the extended runway edges within 1000 feet of the runway end. To minimize the hazards of overruns, the FAA incorporated the concept of a safety area beyond the runway end into airport design standards. To meet the standards, the safety area must be capable, under dry conditions, of supporting the occasional passage of aircraft that overrun the runway without causing structural damage to the aircraft or injury to its occupants.

A Runway Safety Area (RSA) is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.

The identification of compliant vs. noncompliant RSAs allows the Aviation Division to focus on those airports needing assistance in mitigating their RSA issues so they can meet FAA Design Criteria identified in FAA Advisory Circular 150/5300-13A.

According to the WSDOT AIS database, approximately 36 percent of the aviation system's runways are RSA compliant. Table 3-7 shows RSA-compliant runway percentages by state classification. Only 3 percent of *General Use* airport facilities have runways that meet RSA length and width standards.

Table 3-7. Percentage of RSA-compliant Runways

CLASSIFICATION	PERCENT RSA COMPLIANT
Major	37%
Regional	66%
Community	37%
Local	39%
General Use	3%
Overall System	36%

Source: WSDOT, Airport Information System database, 2016

[8] WSDOT, Washington State Airport Pavement Management System, Executive Summary, 2013

3.2.3 Taxiways

Taxiways create mobility for aircraft that have just landed or those aircraft preparing to land/depart and are a critical part of an airport's facilities and airfield safety. There are three common types of taxiways at Washington State airports: parallel, entrance/exit, and crossing taxiway (Table 3-8). A parallel taxiway runs parallel to the runway, either fully or partially, providing separation from the runway for clear takeoff and landing, as well as an approach to the apron. The entrance/exit taxiway provides entrance and egress on a bidirectional runway, and the crossing taxiway provides access between dual parallel taxiways.

Table 3-8. Taxiway Types by Classification

AIRPORT CLASSIFICATION AND TAXIWAY TYPE	NO. OF TAXIWAYS
Major	134
Crossing taxiway	5
Entrance-exit taxiway	112
Parallel taxiway	17
Regional	155
Entrance-exit taxiway	126
Parallel taxiway	29
Community	150
Entrance-exit taxiway	113
Parallel taxiway	37
Local	100
Entrance-exit taxiway	79
Parallel taxiway	21
General Use	1
Parallel taxiway	1

Source: WSDOT, Airport Information System database, 2016

The taxiway safety area is a graded area extending from the taxiway centerline to a certain distance beyond the pavement that must be capable, under dry conditions, of supporting the occasional passage of aircraft that veer off the taxiway without causing structural damage to the aircraft or injury to its occupants.

Overall, 62 percent of the taxiways in the system report meeting the safety area width standards.[9] Generally, most taxiways in each classification meet the applicable taxiway safety width standards (Table 3-9).

[9] WSDOT, Airport Information System Database, 2016

Table 3-9. Taxiway Safety Area Width Compliance by State Classification

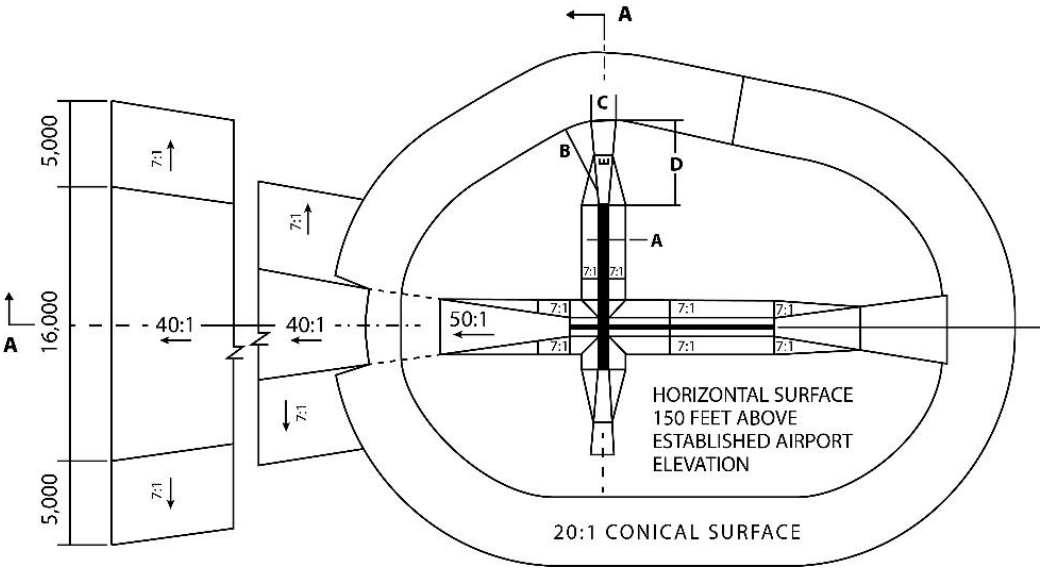
SAFETY WIDTH COMPLIANCE	OVERALL SYSTEM	MAJOR	REGIONAL	COMMUNITY	LOCAL	GENERAL USE
Meets standards	62%	41%	72%	66%	71%	100%
Does not meet standards	9%	0%	0%	25%	11%	0%
FAA approved modification to standards	0%	0%	1%	0%	1%	0%
No information available	29%	55%	18%	7%	9%	0%
NULL	5%	4%	8%	2%	8%	0%

Source: WSDOT, Airport Information System database, 2016

3.3 FAR Part 77

Federal Aviation Regulation (FAR) Part 77 establishes standards and notification requirements for objects affecting navigable airspace, allowing the FAA to identify "potential aeronautical hazards" to prevent or minimize "adverse impacts to the safe and efficient use of navigable airspace."[10] FAR Part 77 defines imaginary surfaces around airports that should be kept clear for flight operations. Objects that penetrate these imaginary surfaces are called obstructions. FAA determines if an obstruction is a hazard to air navigation. Figure 3-7 shows the imaginary surfaces defined by Part 77. Approximately 44 percent of airports included in the study responded that the facility has clear Part 77 approaches. Percentages of airports reporting clear Part 77 approaches is presented in Figure 3-8.

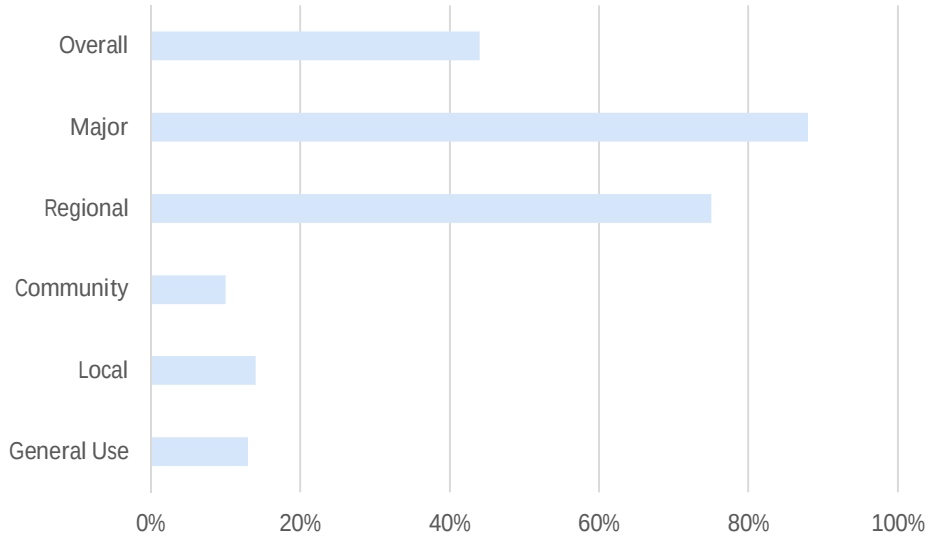
Figure 3-7. FAR Part 77 Two-Dimensional Graphic of Surfaces



Source: NOAA, Aeronautical Survey Program, http://www.ngs.noaa.gov/AERO/yplanfar77.gif

[10] WSDOT Aviation, FAR Part 77 Basics, http://www.wsdot.wa.gov/NR/rdonlyres/2CFA42E4-2718-4884-8FD3-AD2000491AE6/0/FAA_Part77_Basics.pdf

Figure 3-8. Airports Reporting Clear Part 77 Approaches



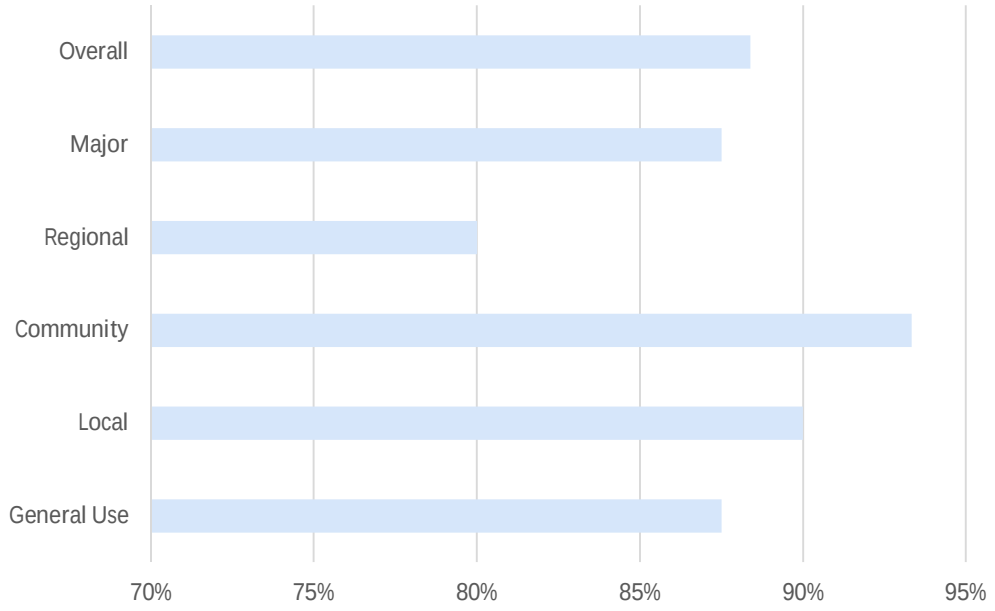
3.4 Landside Facilities and Aviation Services

3.4.1 Accessibility

The ability to provide sufficient access to an airport is critical to its function. Airport access roads provide connectivity between major highways and interstates and key facilities located at the airports throughout the state. Commercial service airports depend on accessibility to/from these roadways to provide their passengers with access to public parking, pick-up/drop-off, as well as the delivery of goods such as cargo, time-sensitive packages, and mail. Highways maintained by WSDOT typically provide accessibility to airports. Airports throughout the state are clearly identified using airport location signs posted along key routes to the airport.

The inventory survey included inquiries about adequate road access and airport signage. According to the survey responses, approximately 88 percent of the overall respondents replied that the airport had adequate access roads and 74 percent indicated that airport signage was adequate (Figure 3-9). Of the *Major* airport facilities that responded to this inquiry, all replied that access roads were adequate.

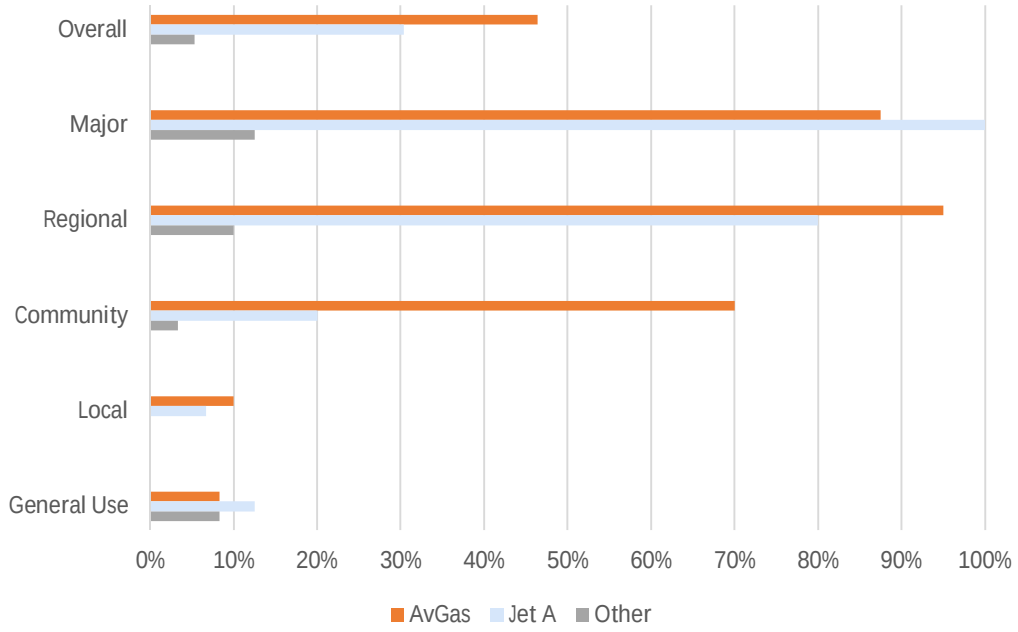
Figure 3-9. Airports Reporting Adequate Access Roads



3.4.2 Fuel Services

Fuel services are provided by many, but not all, public-use airports in the system. Approximately 65 percent of surveyed airports reported providing fuel, including Jet A, 100LL/AvGas, or automotive gas (MoGas). All the *Major* airport facilities reported Jet A fuel services and *Regional* airports reported 80 percent, as the larger turbo prop and jet powered aircraft use Jet A fuel. Figure 3-10 displays the percentage of airports by airport classification that reported having fuel.

Figure 3-10. Fuel Types provided by WA State classification



3.4.3 GA Terminal Facilities

In addition to fuel, most general aviation airports provide a terminal building/facility. This building is utilized by pilots for the use of telephones, restrooms, rest/sleeping quarters, and flight planning activities. At a minimum, a terminal building should include a restroom, phone, and flight planning area. Many times a pilot lounge is sufficient to provide these basic services. All commercial service airports have such facilities. Table 3-10 shows the primary terminal facilities by state classification.

According to the WSDOT AIS database, few airports have passenger terminal facilities, only 18 percent (Table 3-10). All *Major* airports have passenger terminals and all *Regional* airports have passenger/pilot-waiting room facilities.

Table 3-10. Pilot and Passenger Terminal Facilities at Washington State Airports

CLASSIFICATION	PASSENGER TERMINAL	PASSENGER/PILOT-WAITING ROOM	LODGING
Major	10	10	2
Regional	7	20	2
Community	4	19	0
Local	1	8	1
General Use	2	2	1

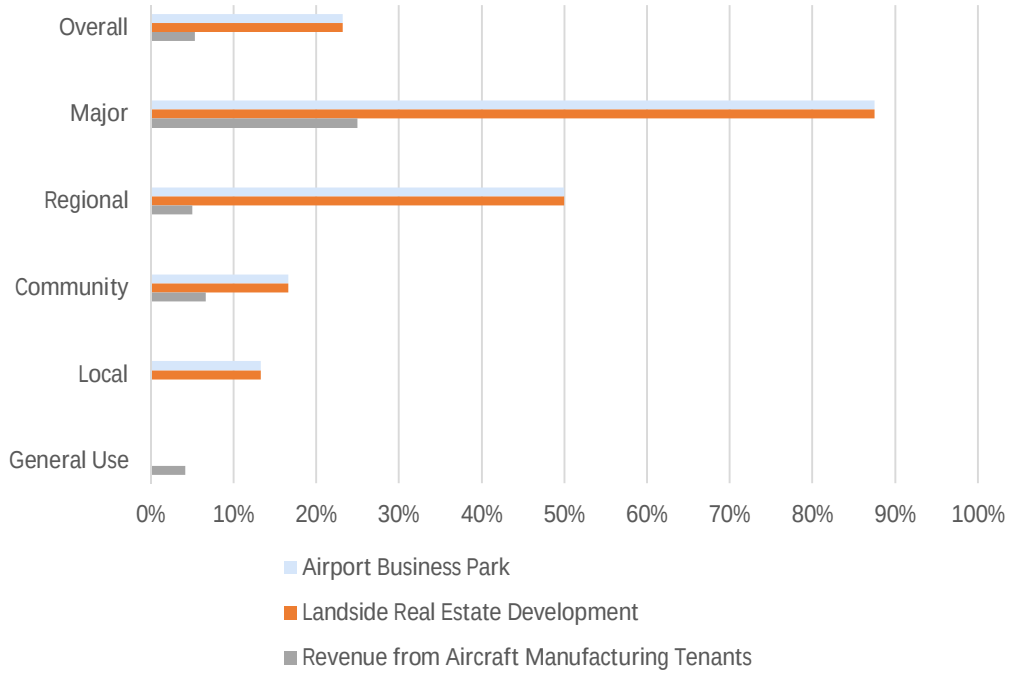
Source: WSDOT, Airport Information System database, 2016

3.4.4 Real Estate/Business Park/Manufacturing Leases

Several airports in the Washington state system have associated business parks or landside real estate developments. A few facilities reported revenue from aircraft manufacturing tenants, including Anacortes, Kenmore Air Harbor (Lake Washington), Pangborn Memorial, Skagit *Regional*, and Snohomish County/Paine Field. Approximately 23 percent of the airports surveyed reported an airport business park or landside real estate development as shown in Figure 3-11. Only 5 percent reported aircraft manufacturing tenants.

Approximately 88 percent of *Major* airports are associated with business park and landside real estate development and 50 percent of the *Regional* airports surveyed. None of the *General Use* airports surveyed indicated business park or landside real estate development; however, 4 percent report revenue from aircraft manufacturing tenants (Figure 3-11).

Figure 3-11. Airport Facilities Reporting Airport Business Park, Landside Real Estate Development, or Revenue from Aircraft Manufacturing Tenants



3.4.5 Aircraft Hangars

Most aircraft owners prefer to store their aircraft indoors to protect against weather. Both public and private entities offer aircraft tie down and hangar facilities for lease at many airports in the state. Tie downs include both based and transient aircraft. Individual T-hangars are adequate for small aircraft, but larger box or corporate hangars are needed to accommodate larger aircraft and are also needed for maintenance businesses. Table 3-11 depicts the percent of tie down and hangar types for each airport classification.

According to the data collected from the survey, 27 percent of respondents reported a wait list for hangar space. A couple of facilities responded that the existing hangar facilities were dilapidated or that there is no existing capacity at the facility for hangar space, so often waiting lists were not maintained even though there is a demand.

The data in the AIS database indicates that most hangar facilities are located at *Major* and *Regional* airports. *Major* airports provide 66 percent of the publicly owned large aircraft hangars and 22 percent of the small aircraft hangars. Snohomish/Paine Field has 85 of the 311 publicly owned large aircraft hangars. *Community* airports provide 33 percent of the system's publicly owned small aircraft hangars with Auburn Municipal providing 232 hangars. *Regional* airports provide the most privately owned facilities with 63 percent of the small aircraft hangars and 47 percent of the large aircraft hangars; Arlington Municipal alone has 405 of the 644 privately owned large aircraft hangars inventoried in the database.

Table 3-11. Percent of Tie Downs and Hangar Types by Airport Classification

TYPE	MAJOR	REGIONAL	COMMUNITY	LOCAL	GENERAL USE	COUNT
Based Aircraft Tie Downs	28%	33%	30%	7%	2%	2,803
Transient Aircraft Tie Downs	16%	30%	33%	17%	3%	1,403
Public Owned Small Aircraft Hangar	22%	38%	33%	6%	1%	2,435
Private Owned Small Aircraft Hangar	8%	63%	23%	5%	2%	2,295
Public Owned Large Aircraft Hangar	66%	19%	11%	3%	2%	311
Private Owned Large Aircraft Hangar	25%	47%	26%	2%	0%	644

Source: WSDOT, Airport Information System database, 2016

3.5 Aviation Activity

3.5.1 Based Aircraft

A total of 63 percent of survey respondents reported based aircraft at their airport facility. The total number of based aircraft reported by the surveyed airport facilities is 13,327. Based on the WSDOT Aviation Division 2016 Statewide Airports Profile Report, the total based aircraft for the system overall is 8,025 (Table 3-12). According to the data reported in the survey, *Community* airport facilities have the most based aircraft. The total based aircraft reported by the surveyed facilities is provided by airport classification in Figure 3-12.

Top 5 airports by based aircraft (Based on the WSDOT Aviation Division 2016 Statewide Airports Profile Report):

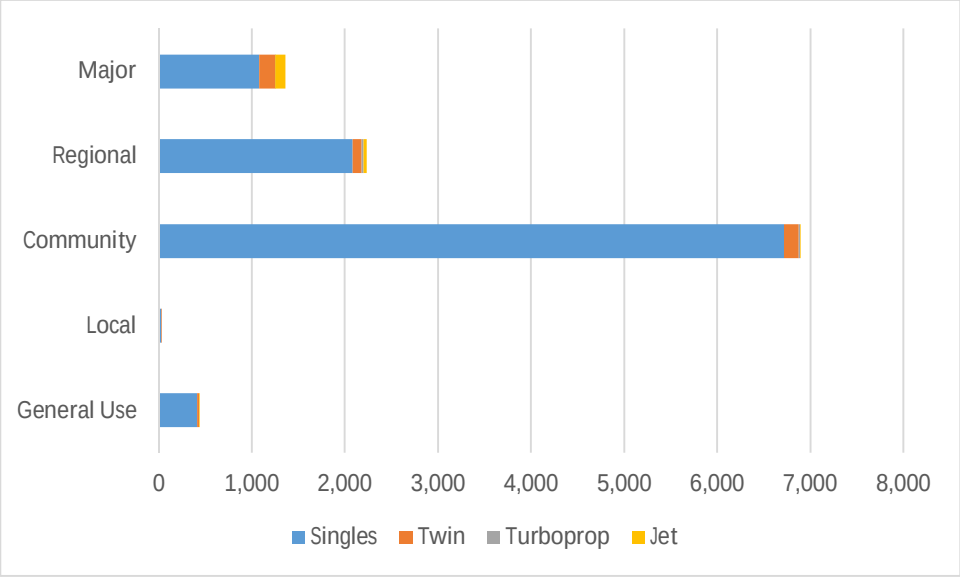
1. *Snohomish County/Paine Field*
2. *Arlington Municipal*
3. *Boeing Field/King County International*
4. *Crest Airpark*
5. *Harvey Field*

Table 3-12. Baseline 2015 Based Aircraft Data Reported in Survey by State Classification

CLASSIFICATION	SINGLE ENGINE	TWIN ENGINE	TURBO-PROPS	JET	HELI-COPTER	OTHER	TOTAL
Major	1,080	170	3	109	52	22	1,436
Regional	2,085	92	25	31	1,064	1,159	4,456
Community	6,716	163	11	2	34	27	6,953
Local	26	1	0	0	0	4	31
General Use	410	22	0	5	11	3	451
Total	10,317	448	39	147	1,161	1,215	13,327

Source: WASP Survey and Inventory, 2015

Figure 3-12. Fixed Wing Aircraft by State Classification



3.5.2 Aircraft Operations and Passenger Enplanements

In 2007, the statewide aircraft operations and passenger enplanements totaled 3.4 and 17.8 million, respectively. The total aircraft operations reported for 2015 by the surveyed airport facilities is 2.2 million with passenger enplanements totaling 16.8 million. Based on the WSDOT Aviation Division 2016 Statewide Airports Profile Report, total operations for the system overall is a little over 3.2 million and total number of enplanements is over 16.8 million. It is important to note that the survey was conducted in late 2015 and many respondents did not provide year-end totals. When available, the data was supplemented by the AIS database.

Top 5 airports by enplanements (Based on the WSDOT Aviation Division 2016 Statewide Airports Profile Report):

1. *Sea-Tac International*
2. *Spokane International*
3. *Bellingham International*
4. *Tri-Cities*
5. *Yakima Air Terminal-McAllister Field*

Major airports reported the most passenger enplanements (16.8 million) while *Regional* airports reported the most total aircraft operations (990,000). The *General Use* airports reported the least passenger enplanements. All the operations and enplanement data reported in the survey is provided in Table 3-13.

Table 3-13. Baseline 2015 Operations and Enplanement Data Reported in Survey by State Classification

CLASSIFICATION	TOTAL AIRCRAFT OPERATIONS	PASSENGER ENPLANEMENTS
Major	584,322	16,805,768
Regional	990,606	53,597
Community	416,824	7,375
Local	78,852	2,700
General Use	163,057	100
Total	2,233,661	16,869,540

Source: WASP Survey and Inventory, 2015

Top 5 airports by air cargo tonnage (2014):

1. *Sea-Tac International*
2. *Boeing Field/King County International*
3. *Spokane International*
4. *Snohomish County/Paine Field*
5. *Tri Cities*

Source: Seattle-Tacoma International Airport data from Port of Seattle; Spokane International Airport data from Spokane International Airport; all other cargo data from the DOT T-100 All Carrier Market data.
Total number of air cargo in metric ton: 518,688

3.5.3 Activities

The WASP survey requested information from each airport regarding aircraft operations activity types. There are three major services for transporting passengers for a fee: commercial service, air taxi and charter. A commercial flight operates on a regular schedule that can be daily, or only on certain days of the week. It adheres to a regular schedule and is operated by a commercial airline, such as Alaska Airlines. With a charter flight the entire aircraft, rather than just one seat. The aircraft can be large or small, and flights can be one-way or round-trip. Air taxi is an aircraft operator who carries 30 or fewer passenger seats and a payload capacity of 7,500 pounds or less, for hire or compensation. Air taxis operate on an on-demand basis and

Top 5 airports by operations (Based on the WSDOT Aviation Division 2016 Statewide Airports Profile Report):

1. *Sea-Tac International*
2. *Boeing Field/King County International*
3. *Crest Airpark*
4. *Auburn Municipal*
5. *Harvey Field*

does not have scheduled flights. Respondents were asked to indicate which activities occur at the airport and to what level, a rating of 1 to 5—1 being "minimal" and 5 being "major." Of the 112 surveys received, some noteworthy revelations emerged; a total of 76 percent of the airports reported emergency medical aircraft operations to some degree occurring at the facility, 70 percent pilot or flight training, 69 percent personal transportation operations, and 55 percent search and rescue operations as well as military exercises. The "Other" activity category included responses such as parachuting, glider operations, winter recreation, as well as helicopter, hot air balloon, and banner towing activities. Angel Flight is the name used by a number of groups whose members provide free transportation for needy patients and perform other missions of community service. All the airport activity data reported in the survey is provided in Table 3-14.

Table 3-14. Aircraft Activity Reported by Surveyed Facilities

AIRCRAFT OPERATIONS	OVERALL	MAJOR	REGIONAL	COMMUNITY	LOCAL	GENERAL USE
Air cargo	21%	100%	35%	17%	10%	4%
Air taxi	27%	75%	40%	23%	13%	21%
Aircraft charter	34%	100%	60%	30%	10%	25%
Emergency medical aircraft operations	76%	75%	85%	80%	80%	58%
Disaster response aircraft operations	47%	50%	45%	40%	50%	54%
Blood tissue and organ transportation	25%	63%	40%	30%	20%	0%
Angel flight operations	35%	75%	60%	40%	20%	13%
Search and rescue operations	55%	63%	50%	53%	60%	54%
Agricultural aircraft operations	43%	38%	30%	43%	47%	50%
Law enforcement aircraft operations	51%	50%	50%	53%	60%	38%
Pipeline control aircraft operations	14%	25%	40%	10%	7%	4%
Pilot/flight training	70%	88%	85%	67%	53%	75%
Military exercises	55%	75%	80%	43%	47%	54%
Skydiving operations	8%	0%	15%	10%	10%	0%
Forest or grassland firefighting	52%	50%	50%	57%	53%	46%
Corporate flight department	17%	100%	35%	10%	3%	0%
Aerial sightseeing	42%	88%	55%	43%	33%	25%
Aircraft manufacturing tenants	14%	63%	30%	13%	0%	4%
Aerial photography	32%	63%	55%	40%	27%	0%
Scientific research	37%	50%	35%	23%	37%	50%
National security	28%	25%	25%	23%	17%	50%
Personal transportation	69%	88%	90%	80%	77%	21%
Business and corporate transportation	48%	100%	85%	43%	43%	13%
Commercial passenger services	20%	75%	20%	10%	7%	29%
Unmanned Aircraft Systems (UAS) manufacturing/research	1%	0%	0%	3%	0%	0%
Other	15%	13%	15%	13%	13%	21%

3.6 State, Local, and Regional Issues

3.6.1 Land Use Compatibility

Incompatible land use encroachment issues have led to airport closures in the state in the past. Incompatible land uses near an airport can result in safety concerns for pilots as well as the general public on the ground near the airport. Additionally, quality of life may be reduced for nearby residents.

Washington State *Senate Bill 6422* (RCW 36.70 and RCW 36.370A.510) requires local land use authorities to protect airports from incompatible development and included technical assistance programs for cities and counties to support land use planning for areas adjacent to airports. In addition, WSDOT Aviation Division created the Airport Land Use Compatibility Program, which supports partnerships between land use jurisdictions and airport sponsors as well as advocating for compatible land uses adjacent to airport facilities. The WSDOT Aviation Division Airport and Compatible Land Use Guidelines (1999) provides local land use authorities with an understanding of how to make the best use of the tools and resources offered by the Airport Land Use Compatibility Program.

The AIS database has an inventory of the predominant zoning classifications adjacent to airport facilities, which is a mix of airport zoning and other land uses and zoning. Table 3-15 illustrates the variety of predominant zoning that exists for the system airports.

Approximately 60 percent of *Major* airports are noted to have airport zoning. Figure 3-13 shows the percentage of airports by classification with Airport Zoning as a predominant zoning class per the AIS database. The survey respondents indicated that 60 percent of the airport facilities have surrounding jurisdictions that have adopted height and land use zoning to protect the airport.

Figure 3-13. Percentage of Airports with Airport Zoning as Predominant Zoning Class

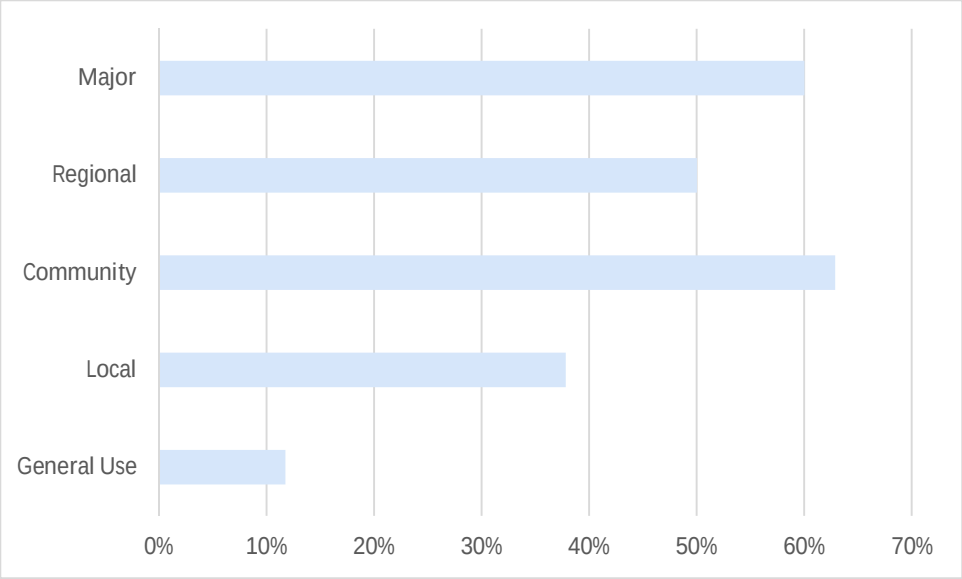


Table 3-15. Predominant Zoning by State Classification

AIRPORT CLASS AND ZONING	NO. OF AIRPORTS
Major	13
Agricultural Zoning	1
Airport Zoning	6
Commercial Zoning	2
Industrial Zoning	4
Regional	26
Agricultural Zoning	2
Airport Zoning	10
Commercial Zoning	1
Industrial Zoning	10
Mixed Use Zoning	2
Public Use Zoning	1
Community	40
Airport Zoning	22
Commercial Zoning	1
Industrial Zoning	9
Mixed Use Zoning	1
NULL	3
Public Use Zoning	3
Rural Zoning	1

AIRPORT CLASS AND ZONING	NO. OF AIRPORTS
Local	39
Agricultural Zoning	2
Airport Zoning	14
Commercial Zoning	4
Industrial Zoning	9
Mixed Use Zoning	1
NULL	5
Public Use Zoning	2
Residential Zoning	1
Rural Zoning	1
General Use	31
Airport Zoning	4
Commercial Zoning	1
Forest Zoning	1
Industrial Zoning	1
Mixed Use Zoning	3
NULL	18
Public Use Zoning	1
Rural Zoning	2

3.6.2 Funding Availability

As mentioned, a total of 64 airports are identified as significant to the national system by FAA and included in the NPIAS. The NPIAS provides the basis of apportioning federal AIP funding. Non-NPIAS airports are not eligible for AIP funding; however, public use facilities included in the WASP are eligible for the Airport Aid Grant Program administered by WSDOT Aviation. The annual competitive grant program provides funding support for critical airport safety, pavement, maintenance, security, and planning projects. NPIAS facilities are also eligible for these funds. The Washington State Classification system is an important tool for helping to identify and prioritize airport improvement and funding needs.

3.6.3 Wildlife Management Plan

Wildlife in and around airports is a difficult issue to manage. Wildlife management plans help mitigate safety hazards associated with wildlife, such as birds, mammals, or reptiles. Of those facilities surveyed, 28 percent indicated that they maintained an active Wildlife Management Plan; however, several

respondents noted that a plan was in progress or that, while a formal plan is not in place, public and pilot education activities help to address wildlife concerns. A few facilities reported that wildlife fences are in place to protect wildlife and airport operations.

3.7 Inventory Summary

As stated previously, the data collected in the inventory process will serve as the basis from which to evaluate future demands in airline passenger traffic, air cargo and general aviation activity, as well as establishing a new state classification system to improve future system performance.

The data collected in this study will also serve as a baseline for future airport studies. Improvements to the system can be measured by comparing current conditions and facilities to the amount of progress achieved over the next several years and serve as a "report card" for future system performance. The summary below presents some of the key findings of the inventory collection process.

3.7.1 Findings

Airside Facilities

- Approximately 27 percent of the system's runways are 5,000 feet or longer and 62 percent of the *Major* airport runways.
- *Major* airport primary runways average 8,966 in length.

FAR Part 77

- Approximately 44 percent of airports included in the study responded that the facility has clear Part 77 approaches.

Landside Facilities

- According to the survey responses, approximately 88 percent of the respondents replied that the airport had adequate access roads and 74 percent indicated that airport signage was adequate.
- Approximately 65 percent of surveyed airports reported providing fuel including Jet A, 100LL/AvGas, or automotive gas (MoGas).
- According to the WSDOT AIS database, 18 percent of airports have passenger terminal facilities. All *Major* airports have passenger terminals and all *Regional* airports have passenger/pilot-waiting room facilities.
- Approximately 23 percent of the airports surveyed reported an airport business park or landside real estate development. Only 5 percent reported aircraft manufacturing tenants.
- According to the data collected from the survey, 27 percent of respondents reported a wait list for hangar space.

Aviation Activity

- A total of 63 percent of survey respondents reported based aircraft at their airport facility.
- The total number of based aircraft reported by the surveyed airport facilities is 13,327; however, the WSDOT Aviation Division 2016 Statewide Airports Profile Report indicates the total based aircraft for the system overall is 8,025.

- According to the survey, *Community* airport facilities have the most based aircraft.
- *Major* airports reported the most passenger enplanements (16.8 million) while *Regional* facilities reported the most total aircraft operations (990,000).
- Of the 112 surveys received, a total of 76 percent of the airports reported emergency medical aircraft operations to some degree occurring at the facility, 70 percent pilot and flight training, 69 percent personal transportation operations, and 55 percent search and rescue operations as well as military exercises.

State, Local, and Regional Issues

- Approximately 60 percent of *Major* airports are noted to have airport zoning.
- The survey respondents indicated that 60 percent of the airport facilities have surrounding jurisdictions that have adopted height and land use zoning to protect the airport.
- Of the airport facilities surveyed, only 4 percent reported a surrounding community that currently has a UAS policy. Many responses indicated that they were unfamiliar with UAS policy or that they were unsure if UAS policies were in place.